



SYLLABUS 2006-07

(Preliminary, May 2006)

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Logistics

- **Class Length:** October 13/14, 2007 – June 01/2, 2007 (9 months)
- **Class Meetings:** Once per month on a Friday/Saturday combination. Most Friday classes will run from 9 am to 5 pm; most Saturday classes will run from 9 am to 3 pm. There will be a few exceptions to accommodate field trips and unit flow. (See Unit Schedule).
- **Class Location:** Seattle Central Community College, Room TBD
- **Lead Instructor:** Kathleen O'Brien Kathleen@obrienandco.com; **Teaching Assistant:** TBD
- **Class Communications:** All communications regarding the class will be circulated by e-mail. Written assignments will be submitted by hard copy either in class or by mailing to the TA. If mailing, please mail to: .

Program Objectives

By the end of this training program, participants should be able to:

- Identify and discuss the key practices of sustainable building.
- Apply LEED™, Built Green™ and other relevant criteria or established guidelines.
- Analyze the costs and benefits of incorporating sustainable building measures.
- Work with architects, designers, builders, building operators, and utilities to improve a building's performance.



- Take advantage of financial incentives and technical assistance offered by governments, utilities and non-profit organizations.
- Establish sustainable design goals for project development.
- Assist in the education and training of staff in your facility or firm in sustainable building.

Course Requirements

- **Class attendance:** 70% attendance is required. To achieve this, you may miss no more than two days of class (irregardless of class length). Please avoid missing whole units, esp. in areas with which you are less familiar. (When planning to be absent, please notify Lead Instructor.)
- **Class participation:** In addition to participating in class discussions and activities, you will need to interact between sessions with your project team: This is primarily done by e-mail, but can include a meeting or two during the year organized around a class session.
- **Project Team:** Students will be assigned to a project team based on project interests and the need for creating teams with a balance of different professionals. They are expected to work effectively with their team to develop the content for their project-related papers and presentations.
- **Papers:** You will be required to write four 3-5 page papers during the year. These papers will relate to the work you are doing in your project team.
- **Presentation:** You will be required to work with your team to develop a 20-minute presentation on the project you have worked on during the year.
- **Homework:** You will be assigned homework to prepare for or synthesize your classroom learning. Some of this may be required, while some may be simply recommended. Since you are most aware of your learning needs, use your best judgment on the latter.
- **Registration:** All registration requirements (paperwork, financial arrangements) must be complete.

At Course Completion, you will be eligible for:

SBAP Certificate: At your final class (and “graduation”), you will receive a certificate of competency to verify that you have completed all of the above course requirements. (Audits may be negotiated but are generally discouraged.)

Eligibility for National Sustainable Building Advisor Program (NaSBAP) Certification

Exam: You may opt to take the National SBAP on-line exam at course completion. If you pass it (with a 70% score), you will receive an additional certificate verifying that you have completed all requirements necessary for NaSBAP certification. The exam is a 2-hour, closed book exam, to be taken under proctored conditions set by NaSBAP. Students learn immediately whether they have passed the test or not. If they have passed, a certificate and actual grade will be sent to them by mail. If they have failed, the screen will inform them of the process for retaking the test. The test will be individually randomized; that is both the order and actual questions will be scrambled by the computer for each student. Specific arrangements for taking the exam will be announced later in the year.



Professional and Academic Credits: The SBA course does not provide professional or academic course credits per se. However, AIA members who have completed the course have successfully attained AIA Learning Units through self-reporting, and this route is available for other professionals as well, depending on their professional society's requirements. In addition, students have attained academic or other credit (such as, for retraining programs) by submitting required forms to the Lead Instructor. It is up to the Lead Instructor to determine if the required submittal is reasonable and something they are willing to do. Therefore, students are encouraged to run evaluation/submittal requirements for course or other credits by the Lead Instructor prior to registration if it is an important consideration for their registration.

Recommended Preparation for those New to Building Industry

The course is geared towards working design and development professionals. However, if you are new-to-building, are returning to the field after some time, OR your expertise is narrowly defined, you might want to prepare yourself by reviewing the following basic texts. The course will NOT be covering basic design/construction concepts or details. *All of the following texts are available at BarnesandNoble.com. You are also likely to find one or more at a local university or college bookstore with construction management or similar programs.*



Construction: Principles, Methods and Materials, Harold Olin, H. Leslie Simmons, @\$90



Fundamentals of Building Construction: Materials and Methods, Edward Allen, Joseph Aano (John Wiley), @\$95.



Encyclopedia of Construction Methods and Materials, William R. Spence (Sterling) Paperback @\$20.



Other suggestions: *Modern Carpentry: Building Construction Details in Easy-to-Understand Form*, by Willis H. Wagner, and check out *The Journal of Light Construction*, *Fine Homebuilding*, and architectural journals.

Also, visit a job site! Proper protocol is to call the contractor and connect with the field supervisor, and tell them you want to get the feel of a building project in process. (Don't just show up!) Wear sturdy shoes and be amenable to a quick visit...they're usually pretty busy! And bring cookies...

Required Texts



Ecological Design, Sim Van Der Ryn, Stuart Cowan, Island Press (1996). \$24 (paper), plus shipping. Visit www.islandpress.org or call 1-800-828-1302.



GreenSpec: Environmental Building News Product Directory and Guideline Specifications. \$89 plus shipping. OR you may take advantage of a special student discount offered by Building Green to get the on-line suite for \$78 (regular price is \$199)

INSTRUCTIONS

Go to <http://www.buildinggreen.com/index.cfm>
Click on "Store" on the top blue bar at the far right
Click on "BuildingGreen Suite"
Click on "Subscribe"
Click on "Next step"
Click on "Proceed to cart"
Enter Promotional code in the window next to "Promo"
SBA2006
Price should change from \$199 to \$78
Click on "Check out" at the lower right
Fill in necessary information
Click on "continue"
Enter credit card # and click on "Place order"
Read information and click on "Continue"
Follow instructions for first-time log-in



Sustainable Building Technical Manual, Public Technology Inc., (1996) \$36 (book) and \$20 (.pdf) (inquire about discount for PTI members) at <http://pti.nw.dc.us>. Navigate to the Store and it is under Energy Call 1-800-PTI-8976 or e-mail at pubs@pti.org.

General References



A Primer on Sustainable Building, Rocky Mountain Green Development Services, Dianna Lopez Barnett with William D. Browning.



The HOK Guidebook to Sustainable Design, Sara Mendler and William Odell, John Wiley.

Many additional references and resources will be supplied throughout the year.

Types of Assignments

Individual Work

An Assignment Summary table should be provided along with this Syllabus. Assignments are also described in your handout notes.

Unit Preparation Assignments: Will include required and recommended reading, analysis/observation, and writing assignments. These assignments are due by the opening session of the unit for which you are preparing.



Unit Synthesis Assignments: Will include required and recommended analysis/observation, reading and writing assignments. These assignments are due on a date assigned by the lead instructor, subsequent to the unit's completion. Only hard copies of written assignments (not e-mailed) will be acceptable (2-sided please).

Team Work

A separate handout will explain the team project in detail. Briefly, it consists of a project analysis that takes place over the course of several units. Early in the course, we will be introducing project examples that will be assigned to groups for analysis throughout the remainder of the year. Ideally, these examples are drawn from projects that students are involved with in some way, and represent a diverse sample of projects. In the past, project examples have included school buildings (from middle school to university), multi-family residential (including mixed use, affordable, and market rate apartments), commercial office and retail. These projects have been located in urban and ex-urban locations and have included buildings at all phases of construction (from schematic design to construction completion). You are encouraged to propose a project for this purpose. It would be important to have access to plans, specs, and boards for the projects or access to a responsible party associated with the project.

Building Project Team Analysis: Groups will evaluate projects and discuss possible strategies for improving sustainability in the course topic areas. In the past groups have organized site visits (usually scheduled around the class schedule), conducted e-mail conversations and information sharing, and divvied up research areas.

Individual Paper Submittals: Individual students will be responsible for completing research and preparing a paper summarizing results of this research. This paper should be your own work, although teams are encouraged to share information. You will be provided very specific requirements for content of these papers when the Team Project commences. **It will not be acceptable to hand papers in late, or to combine individual papers into one final paper.**

Team Final Presentation: Each of the 5 or 6 teams will make a 20-minute presentation on their project. This presentation is scheduled for the last class session (the same day as graduation, see schedule below).



Unit Schedule

<u>Unit</u>	<u>Title</u>	<u>Location</u>	<u>Length</u>	<u>Dates</u>
1	Fundamentals of Sustainable. Building & Design	Classroom	7 hours	Friday, 10/13/2006
2	Importance of Place: Site Assessment	Classroom & Field	5 hours	Saturday, 10/14/2006
2	Importance of Place: Land Use, and Transportation	Classroom	7 hours	Friday, 11/03/2006
1/2	"Green Buildings, Green Communities"	Field Trip	5 hours	Saturday, 11/04/2006
3	Climate Responsive Energy Design	Classroom	7 hours	Friday, 12/08/2006
3	HVAC, Domestic Hot Water; Daylighting	Classroom	5 hours	Saturday, 12/9/2006
3	Daylighting; Electric Lighting	Classroom	7 hours	Friday, 1/12/2007
3	Green Power; Whole Building Topics	Classroom	5 hours	Saturday 1/13/2007
4	Green Material Selection	Classroom	7 hours	Friday, 2/09/2007
5	Indoor Environmental Quality & Health	Classroom	7 hours	Saturday, 2/10/2007 ¹
3/4/5	"Healthy, Energy Efficient Buildings"	Field Trip	7 hours	Friday, 3/09/2007
5	Indoor Environmental Quality & Health	Classroom	7 hours	Saturday, 3/10/2007 ¹
6	Water Conservation & Quality Protection	Classroom	7 hours	Friday, 4/13/2007
6	"Designing with Water in Mind"	Field Trip	5 hours	Saturday, 4/14/2007
6	Water Conservation & Quality Protection	Classroom	7 hours	Friday, 5/11/2007
7	Sustainable Job Site Operations	Classroom	5 hours	Saturday, 5/12/2007
7	"Green Job Site Practices"	Field Trip	3 hours	Evening (tbd),
8	Sustainable Operations and Maintenance	Classroom	7 hours	Friday, 6/01/2007
Final	Presentations & Graduation	Classroom	4 hours	Saturday, 6/02/2007

¹ These Saturday sessions run two hours longer than usual.



UNIT DESCRIPTIONS

Unit 1: Fundamentals of Sustainable Building and Design

Session

Friday October 13, 2006

Objectives

This unit provides a foundation for understanding individual green building study areas that when integrated comprise sustainable building. In addition it provides:

- The “case” or rationale for green building.
- A view of the current state of green building in the region and nationally
- The principles of sustainable design
- An introduction to the practicum project (team analysis, paper, and final presentation)

Topics

Sustainability as context. What role do buildings play in the environmental problem? Defining green building. How does green building address local/regional economic, environmental, equity issues? What does “green building look like (case studies)? Benefits and challenges. Getting green building on the ground: public policies and market-driven initiatives. Setting the bar for commercial and residential projects: rating systems, guidelines, and other market drivers. What’s different about sustainable design? Recognizing effective green specifications.

Instructor

Kathleen O’Brien

Unit 2: The Importance of Place: Site, Transportation and Land Use Issues.

Sessions

Saturday October 14, 2006, and Friday November 3, 2006. Also “Green Buildings, Green Communities” Field Trip, Saturday, November 4th, 2006.

Objectives

This unit demonstrates the importance of “place-based” thinking in achieving truly sustainable development. It provides:

- An introduction to sustainable site design
- An understanding of the site planning process
- An opportunity to practice sustainable site analysis and conduct a site assessment
- A discussion of the importance of transportation planning and siting and their relationship to sustainability
- A survey of strategies to achieve sustainable transportation patterns and site development.



Topics

Overview to Site Design. Site planning and analysis: biophysical, social, economic factors. Market analysis vs. site analysis. Basic steps of site analysis. Site assessment (Practicum). Getting people out of cars and into their neighborhoods: strategies for optimizing land use; transportation fundamentals. Smart growth. Recycling land: brownfields and other redevelopment.

Instructor(s)

Peter Hurley, Katherine Morgan, Michael Lockman

Unit 3: Energy Efficient Design (Energy & Lighting).

Sessions

Friday December 8 and Saturday December 9, 2006. Friday January 12 and Saturday January 13, 2007. Also, Field trip Friday, March 9, 2007.

Objectives

The unit provides a foundation for understanding how a building with high energy and lighting performance (efficiency and quality) is achieved. It provides:

- An understanding of what energy is and how the design of building energy systems impacts both the human experience and the global environment.
- An appreciation of the value of a contextual, holistic approach to building energy system design.
- An understanding of how a building dynamically interacts with its occupants and the local climate, including renewable energy flows.
- Basics for understanding fundamental building energy systems, primarily the building envelope, HVAC, and lighting.

Topics

Energy and the environment: Why should we care? Overview of the Building Energy System Design Process. Assessing human functional and physiological needs, local climate and free energy resources. Design scenarios. Passive solar design. Building Envelope. Plug Loads. Domestic Hot Water. HVAC. Daylighting. Electric Lighting. Green Power. Whole Building Topics. Distributed.

Instructor(s)

Sandra Mallory, Barbara Erwine, Duane Llewellyn, Michael Lane, Jeremy Smithson, Peter Dobrovolsky, Kathleen O'Brien

Unit 4: "Green" Material Selection.

Session

Friday, February 9, 2007.

Objective

This unit provides a foundation for understanding the issues underlying material selection and planning in a sustainable building. It covers:



- Factors in material selection and the issue of trade-offs
- Resources available to assist in evaluating whether a material is appropriate for a sustainable building project
- The analytical process one might take to evaluate materials for a project
- Material considerations when using the LEED rating program
- Material considerations when designing a green home.

Topics

Characteristics of “green” materials: resource utilization, toxicity and health, embodied energy. Life Cycle Assessment and its place in sustainable design. Tools and trends in material selection. Materials analysis. Looking at the science behind controversial materials. Green materials and LEED. Strategies for green homes. Identifying low hanging fruit. What’s achievable?

Instructor(s)

Chris Dixon, Alistair Jackson

Unit 5: Indoor Environmental Quality & Health.

Sessions

Saturday, February 10, 2007, and Saturday March 10, 2007 Also: “Healthy, Energy Efficient Buildings” Field Trip, Friday, March 9, 2007

Objectives

This unit provides a foundation for understanding the issues that contribute to and help prevent inferior indoor environmental quality. It covers:

- Benefits of improving indoor environmental quality
- Common indoor air pollutants
- Barriers and solutions to achieving good indoor air
- Implementation issues to help achieve good quality indoor air
- Ventilation system design strategies
- Linkages between health, well-being, and productivity
- Physical, psychological and financial benefits of daylight and views

Topics

Health and sustainability: the rationale for incorporating IEQ as part of a “green” scheme. Healthy IEQ Guidelines: LEED and other systems. Indoor Air Pollution 101: the problem. Achieving good indoor air quality: the science and design implementation issues. Understanding MSDS. Developing an IAQ Construction Plan and commissioning issues. Designing innovative ventilation systems for good IAQ. Designing for health and well-being.

Instructor(s)

Dan Morris, Judith Heerwagen, Matt Younger, Kathleen O’Brien



Unit 6: Water and Site Design.

Sessions

Friday April 13, and Friday May 11, 2007 Also, “Site Design with Water in Mind” Field Trip, Saturday, April 14, 2007. (Field trip is between two in-class sessions.)

Objectives

This unit provides a foundation for understanding how to conserve water and protect water quality through the application of sustainable design. It covers:

- an overview of the impacts of conventional site and landscape design and maintenance practices, and the benefits of adopting a natural systems-based approach
- challenges and opportunities of sustainable site development patterns
- reducing impact through landscape layout, plant selection and placement
- an understanding of outdoor water conservation strategies and practices
- an exploration of on-site management methods for stormwater and wastewater
- a discussion of approaches to indoor water conservation

Topics

Designing with nature: an overview. Problems and issues with water and site practices. Nature as a model approach. Overview of site and landscape solutions. Sustainable site development patterns. Sustainable landscaping: the dirty details. Outdoor water conservation and irrigation efficiency: use vs. supply. Solutions by phase. Innovative on-site water management methods. Using low impact development (LID) practices to protect water quality. No water is wastewater. Indoor water conservation: assessments, strategies.

Instructor(s)

David McDonald, Karen Kiest, Michael Laurie, Chris Webb

Unit 7: Sustainable Job Site Operations.

Sessions

Saturday, May 12, 2007. Also, “Green Job Sites” Field Trip/Case Study Session Weekday Evening Session date (to be announced).

Objective

This unit teaches students how to work effectively with the contractor to implement green building on a project; or if they are in construction, how to be a “green contractor”. It provides:

- Overview of green construction practices – construction waste management, site protection, and IAQ protection.
- Discussion on incorporating green building materials
- Guidance on good planning and communication practices for sustainable construction practices



Topics

Benefits, basic strategies, and best management practices for waste management, site protection (temporary controls), and IAQ protection during construction. Techniques for effective planning and implementation.

Instructor(s)

Elizabeth Powers

Unit 8: Building Operations and Maintenance.

Session

Friday, June 1, 2007

Objectives

This unit provides a foundation for integrating sustainability into building operations and maintenance. In particular, it presents information on:

- The facility management (FM) functions with a focus on understanding the duties of the FM department in an organization, the education and experience of FM professionals, and how FM departments are positioned in organizations to ensure successful performance of the building post-occupancy.
- Building commissioning (Cx), what it is, how it is accomplished, and why it is critical to the performance of a building.
- Elements and activities conducted as part of effective operations and maintenance..
- Criteria for an effective training program and training resources with the goal of enabling the SBA to serve as a training resource for facilities professionals involved in sustainable building projects.

Topics

Facility Managers: what do they do and why they are key to real change. Building Commissioning: what is it and why is important. Weaknesses in traditional approach. Recommended approach. The role of O&M traditionally, what it could be to get to green and stay there. Designing effective O&M training programs.

Instructor(s)

John Heinz, Cynthia Putnam, Lori Moen

Note: Unit 8 is immediately followed (the next day) by the final presentation/graduation. Please see schedule and earlier description.